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ABSTRACT

This report focuses on strategies documented by the Commonwealth Fund Task Force on Academic Health Centers (AHCs) concerning AHCs' management of patient care and research missions. Whatever challenges AHCs face in the future, their ability to respond effectively will be determined by the quality of their governance and management. To improve their capabilities, AHCs are adopting organizational reforms, including unified clinical and academic governance, increased autonomy for the clinical enterprise, reforms in faculty governance, mission management, and improved information systems. To date, AHCs have devoted relatively little attention to leadership development. Most of their time and energy has been directed toward designing reforms to enhance their clinical market share while reducing clinical costs. Strategies to this end include developing primary care capabilities and protecting specialty care markets. Virtually every AHC has made efforts to reduce costs over the last decade, and some have turned to strategies to reduce dependence on the clinical enterprise. AHCs must continue to support research activities, attracting new sources of funding and improving the management of research funds and activities. In spite of all their efforts, AHCs have missed some important opportunities to increase their competitiveness and efficiency. Development of the capacity for innovation is essential for the future success of AHCs. (Contains 66 references.) (SLD)

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MANAGING ACADEMIC HEALTH CENTERS: MEETING THE CHALLENGES OF THE NEW HEALTH CARE WORLD

A Report of The Commonwealth Fund
Task Force on Academic Health Centers

October 2000

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EXECUTIVE SUMMARY

The 1990s witnessed dramatic changes in the internal organization and management of academic health centers (AHCs) as they struggled to maintain their social missions in a tumultuous health care marketplace. It was a decade of radical transformation for many AHCs, requiring rapid response to unprecedented challenges from private markets and governmental policy.

The Commonwealth Fund Task Force on Academic Health Centers has long worked to help preserve the nation's 125 AHCs and their social missions of providing specialty care, biomedical research, graduate medical education, and continuous innovation in health care. Throughout the 1990s, Task Force members carefully observed AHCs to learn how their missions might be preserved. They conducted exhaustive research—including case studies, focus groups, and literature review—into how these missions were threatened by new competition in the health care marketplace and changing public policies. They also looked into how AHCs might respond through such means as increased clinical activity and specialized care, and more sophisticated management techniques.

Past reports and journal articles of the Task Force have focused primarily on developing current information on the status of AHCs and their missions and making recommendations for public policy that will preserve and enhance these missions.[1-5] Now, the Task Force is focusing on reviewing and synthesizing information on the internal strategies—changes in organization, management, governance, and relationships with other local institutions—that AHCs in this country are adopting to assure their survival and the health of their missions.

This report focuses on strategies documented by the Task Force concerning AHCs' management of patient care and research missions. Changes in the management of educational missions will be covered in a later document devoted exclusively to this topic.

CHALLENGES FACING AHCS IN THE NEW HEALTH CARE MARKETPLACE

AHCs face two kinds of challenges to their social missions: financial and managerial. Competitive health care markets and reduced payments from public programs have caused unprecedented financial difficulties for some of the nation's leading AHCs, such as the Beth Israel–Deaconess Medical Center in Boston; the University of California, San

Francisco; and the University of Pennsylvania. These institutions and many more must find the resources necessary to sustain mission-related activities.

Even in the absence of these financial challenges, reforms would be necessary to deal with the growth of managed care and the changing nature of research and education. To serve society's needs and achieve their potential, AHCs must teach physicians new skills, conduct more interdisciplinary research, accommodate the increasing importance of industrial sponsors of research, and take advantage of the information revolution. All these demands require changes in the management of AHC missions.

IMPROVING AHC GOVERNANCE AND MANAGEMENT

Whatever challenges AHCs face in the future, their ability to respond effectively will be determined by the quality of their governance and management. To improve these capabilities, AHCs are adopting a number of reforms.

Organizational Reforms

Unified clinical and academic governance. To align the interests of academic and clinical enterprises, some AHCs have created leadership positions with joint responsibilities for the medical school and clinical facilities. These positions carry a variety of designations—vice chancellor for health affairs, executive vice-president for health affairs, provost of the health science center. All are intended to assure that clinicians, clinical managers, and faculty work more effectively together.

Increased autonomy for the clinical enterprise. The fast-paced world of health care markets requires faster decision-making than university managers and state bureaucracies can accommodate. Some private universities are spinning off their AHCs' clinical facilities, giving them more autonomy. Some state universities are also reducing state oversight by turning AHCs into quasi-public entities.

Reforms in faculty governance. AHC faculty have enjoyed all the prerogatives of traditional university faculty, including self-governance, lack of direct accountability for their activities, and lifetime tenure. Faced with the pressure to respond to clinical competition, some AHCs are increasing faculty accountability to deans and department chairs by modifying terms of tenure and specifying faculty responsibilities.

Mission management. AHCs are instituting organizational changes that increase their ability to supervise research, educational, and patient care activities. The central idea is to align the interests of clinical and academic elements of the AHC.

Improved information systems. Within the limits of their capital, AHCs are experimenting with new information systems, such as funds flow accounting and physician order entry. These systems are designed to improve information available for developing high-quality management skills and accountability of mission-related activities.

Leadership Development

Unlike industrial organizations outside of health care, AHCs have devoted relatively little systematic attention to developing leaders within their organizations or to assuring seamless transition when leaders retire. These institutions must work to ensure that they give sufficient attention to this challenge.

REFORMING THE CLINICAL ENTERPRISE

The Task Force has found that AHCs are devoting most of their time and energy toward designing reforms to enhance their clinical market share while reducing clinical costs. These institutions are focusing on several strategies to accomplish this.

Strategies to Increase Volume and Market Share

Developing primary care capabilities. Maintaining the capacity to provide primary care is vital to the survival of AHCs but has proved difficult and expensive. These institutions have pursued three primary strategies: the assembly strategy, in which primary care physicians are hired into faculty group practices; the acquisition strategy, in which AHCs purchase primary care practices in the community; and the affiliation strategy, in which AHCs form contractual relationships with primary care networks or providers. All three have advantages and disadvantages, and the preferred approach or combination of approaches remains uncertain.

Protecting specialty care markets. In the rush to build primary care capacity, some AHCs lost sight of the vital role of protecting market shares and patient volumes in specialty care, including such functions as cardiac care, burn units, and transplant services. Now, a number of institutions have instituted reforms to enhance and market their unique capacities to deliver high technology and specialized services. Furthermore, highly publicized AHC mergers have often been carried out to reduce competition for patients with rare conditions.

Strategies to Improve Efficiency and Reduce Costs

Virtually every AHC has made efforts to reduce costs over the last decade. These approaches have included reducing the size of staffs and physical plants; merging with other AHCs to achieve economies of scale; and developing integrated delivery systems. Results have varied and are difficult to document. A number of mergers between AHCs

and non-academic systems designed to create integrated delivery systems have been liquidated because of cultural and financial conflicts. On the whole, however, AHCs have reduced the costs of case mix adjusted admissions.

Strategies to Reduce Dependence on the Clinical Enterprise

Some AHCs have concluded that the ownership and management of clinical facilities is too risky or difficult under current market circumstances and have sold their hospitals to for-profit or nonprofit hospital chains. The effects of these sales on mission-related activities remain to be fully documented, but preliminary studies of sales to for-profits indicate no short-term adverse results.

REFORMING THE RESEARCH ENTERPRISE

Despite growth in the budget of the National Institutes of Health, AHCs must continue to find additional funds to cross-subsidize expanding research activities. They must also adopt reforms to get the most out of limited discretionary funds and to compete with contract research organizations (CROs). (The CRO industry, which now includes a number of publicly traded, multinational companies, conducts large-scale clinical trials for pharmaceutical companies.)

Attracting Alternative Sources of Research Funds

Industrial research support. AHCs are streamlining their clinical research activities to reduce costs and increase responsiveness to industrial funders. Some AHCs are organizing their own nonprofit, internal CROs.

Commercializing research. AHCs have become more aggressive in commercializing the results of their own research. This involves establishing internal offices for licensing and technology transfer.

Reforming Research Management

Resource management. Several AHCs have undertaken formal strategic planning in research for the first time. In addition, they have begun husbanding their internal research funds more diligently by allocating space and discretionary monies using peer review and formal metrics of productivity.

Management of clinical research. Recent reports have documented the importance of and under-investment in clinical research activities within the United States. AHCs are being pressed to adopt reforms to improve the management of clinical research, including improving the professional lives of clinical researchers and the efficiency of their clinical research activities.

Improving the management of industrial relationships and resolving conflicts of interest
Increased involvement by AHCs with industrial organizations and the commercialization of research creates threats to traditional academic values. AHCs have been slow to implement formal mechanisms to address these conflicts, such as rigorous disclosure requirements and policies governing financial conflicts on the part of investigators conducting clinical trials.

CONCLUSION

Despite all their efforts, AHCs have missed some important opportunities to increase their competitiveness and efficiency. Their efforts to develop internal leadership, for example, are primitive by the standards of other industries. Their information systems are similarly underdeveloped, complicating the management of both clinical and mission activities.

It is also far from clear that AHCs' diverse and extensive reform initiatives will prove sufficient to prepare them for continuing tumult in the health care system. Ultimately, these institutions, though university-based, are intimately connected to health care. As its costs increase, so do AHCs'. As society seeks to redirect and reform the health care system, it will inevitably demand comparable changes from AHCs.

Perhaps the most important capability for the future success of AHCs and their mission-related activities is the development of the capacity for innovation: skilled, creative leadership; adaptive and flexible governance; improved information systems to support decision-making; and an appropriate balance of centralization and decentralization within the unique structure of the university-affiliated clinical enterprise. Developing this capacity for adaptation will require that AHCs become much more self-critical and open than they have been in the past. As long as society continues to entrust AHCs with essential social functions, their ability to become truly modern institutions will remain of vital interest to the public and its representatives.

PART 1. INTRODUCTION AND BACKGROUND

The Commonwealth Fund Task Force on Academic Health Centers has long worked to help preserve the social missions of providing specialty care, biomedical research, graduate medical education, and continuing innovation in the nation's academic health centers. The Task Force has studied how these missions are threatened by new competition from managed care and has targeted its work toward three fundamental objectives:

- Developing current information on the status of AHCs and their missions.
- Making recommendations for public policy that will preserve and enhance the missions of AHCs.
- Identifying and disseminating best practices in the preservation and enhancement of AHCs missions.

Past reports and journal articles of the Task Force have focused primarily on the first two of these objectives.[1-5] Now, the Task Force has turned to the last by reviewing and synthesizing information on the internal strategies—changes in organization, management, governance, and relationships with other local institutions—that AHCs in this country are adopting to assure their survival and the health of their missions.

In this endeavor, the Task Force has gained information from multiple lines of research it has conducted through the years, including:

- Dozens of individual AHC case studies.
- More than 50 site visits to AHCs by staff of the Center for the Advancement and Management of Change in Academic Medicine of the Association of American Medical Colleges.
- Work with the Association of Academic Health Centers and the University HealthSystem Consortium, including projects sponsored by the Task Force.
- Review of the growing literature chronicling the efforts of AHCs to adapt to the challenges they face and to prepare for new challenges in the future.

The authors of this report have tried wherever possible to evaluate the implications of changes AHCs are undertaking for the health of their social missions. The Task Force

hopes to assist individual institutions in identifying those practices that deserve propagation and those that hold less promise. Readers should be aware, however, of the limitations inherent in any attempt to reach conclusions on the value of particular strategies and tactics pursued by AHCs in the fast-changing health care environment. Given the constantly evolving AHC response, many reforms are too new to be evaluated definitively. Many are undertaken as part of comprehensive and multifaceted initiatives whose individual parts cannot be easily disentangled for rigorous evaluation.

In addition, changes that work well or poorly for some AHCs may have dramatically different effects for AHCs with different internal resources or environmental circumstances. Therefore this report should be seen primarily as an attempt to identify options for reform and to chronicle the limited data on their strengths and weaknesses. Furthermore, readers should be aware that, given the number and dynamism of today's AHCs, this report will inevitably miss some interesting and relevant AHC strategies. Definitive evaluation of best practices for preserving the missions of AHCs is likely to remain an elusive goal, but this effort has value as a heuristic process and should be the object of continuing study by the Task Force and other interested groups.

The remainder of this report is organized as follows. Part 2 reviews the challenges that AHCs must overcome to sustain their vital missions. Part 3 describes Task Force findings concerning AHCs' efforts to reform their governance and management structures, since changes in these domains provide the foundation necessary for success in responding to challenges of all types. Part 4 reviews AHCs' attempts to revise their clinical enterprises. Part 5 discusses efforts to reform AHCs' research enterprise, and Part 6 provides a summary and conclusions.

PART 2. CHALLENGES FACING AHCS IN THE NEW HEALTH CARE MARKETPLACE

AHCs face two types of challenges. The first is to find the resources needed to sustain their mission-related activities in the face of economic pressures. The second is to change and improve the management of their mission-related activities, so they can respond to evolving societal needs and provide the most social benefit from their limited resources.

Financial Threats to AHCs

Information from a variety of sources indicates the increased difficulty that some AHCs have encountered recently in developing the resources needed to fund their social missions.[1-6] While AHCs continue to enjoy federal and state support for research, education, and care of the indigent, these funds are rarely sufficient to sustain current levels of these activities.[1-5] Thus, AHCs cross-subsidize their mission-related activities with internal funds.[7] Especially in the most competitive health care markets,[8] such cross-subsidies are less plentiful than they once were, or are used increasingly for new clinical initiatives designed to protect clinical market share.[2] While Medicare payments to AHCs once provided high inpatient margins, reductions under the Balanced Budget Act (BBA) of 1997 are adding to pressures from private markets.

Additional evidence of financial stresses on AHCs and their problems sustaining investment in mission-related activities include the following:

- An unprecedented number of the nation's most eminent AHCs experienced fiscal difficulties in 1999. These hardships were manifested by operating losses, downgrades in bond ratings, substantial layoffs, and/or wholesale changes in leadership. Among the centers affected were Beth Israel–Deaconess Medical Center, Detroit Medical Center, Duke University Medical Center, Georgetown University Medical Center, Partners HealthCare System (including Massachusetts General Hospital and Brigham and Women's Hospital), University of Minnesota Medical Center, University of Pennsylvania Health System, and the University of California, San Francisco (UCSF)/Stanford Health System. For the first time, an American AHC (Allegheny Health System) went bankrupt and was liquidated in 1999. While the majority of AHCs in the United States continue in the black, none have yet felt the full impact of the 1997 BBA. They also face continued payment reductions from commercial payers.

- Faculty practice plans in the most competitive markets have declining margins and have experienced difficulty subsidizing research and teaching by their faculty, traditionally an important resource.[2,5,6]

- Faculty in highly competitive markets are less certain of their future in academic medicine than faculty in less competitive environments.[9]

- Faculty participation in clinical research is increasing less rapidly in highly competitive markets compared with other areas of the country.[10]

A continuing source of anxiety for many AHCs is their growing dependence on equity markets for their financial survival. Many institutions that have been losing money from operations have maintained positive bottom lines as a result of growth in the value of their endowments and cash reserves during the prolonged bull market of the 1990s. The long-expected correction in equity values could substantially affect the financial viability of a large number of AHCs.

The Need to Change and Improve Management of Mission-Related Activities

Even if AHCs were not encountering financial stresses, they would face requirements to reform their mission-related activities. To be responsive to societal needs and changing markets, AHCs will have to produce new types of educational, investigative, and clinical services.

As the health care system evolves, so must the services of AHCs. Health professionals trained at AHCs need new and different skills, requiring changes in medical education.[11] Different types of new knowledge in areas such as quality improvement, genetic epidemiology, and clinical process redesign become relevant, demanding changes in the type and mix of investigation conducted at AHCs.[2] These institutions have been criticized in the past for training too many specialists and too few primary care physicians,[12-18] for failing to teach skills needed to reduce the costs of health care and to improve its quality,[17,18] and for leaving health professionals unprepared for practice in ambulatory and managed care settings.[16,19-21] AHCs have also been denounced for under-supporting and underemphasizing clinical investigation, research on preventive care, outcomes studies, clinical epidemiology, and health services research.[2,16]

Another source of pressure to change AHCs' mission-related activities is the advent of competition from for-profit entities seeking to perform some of the functions traditionally dominated by AHCs. An example is the growth of contract research

organizations (CROs). The CRO industry, which now includes a number of publicly traded, multinational companies, conducts large-scale clinical trials for pharmaceutical companies. It has responded to the drug industry's need for faster, cheaper, and more reliable clinical data that can be used in gaining regulatory approval of new products. Some pharmaceutical companies have come to see AHCs as slow, inefficient, and unreliable suppliers of clinical trial services, a perception supported by fragmentary data.[22]

To service CROs, another related group of companies has arisen, so-called site management organizations (SMOs). These for-profit organizations enlist and manage the physician practice sites that actually recruit and follow patients enrolled in clinical trials. In some cases, faculty practices participate in clinical trials as members of SMOs, even when the AHC itself is not involved. Recently, industry observers have noted that public relations companies are entering the clinical research business by buying up CROs that service the pharmaceutical companies that these advertising companies also work for. The purpose is to develop integrated businesses that can service all the drug development and marketing needs of pharmaceutical giants, from testing to marketing. Bizarre as this development may seem, it illustrates the turmoil that has struck the formerly placid research markets in which AHCs operated.[22,23]

Another potential challenge to AHCs arises from the information technology revolution.[24,25] In the past, AHCs occupied strong market niches as suppliers of continuing medical educational (CME) services to physicians and as sources of authoritative health care information for consumers. Even if a particular AHC did not enjoy a national reputation in the CME and health education market, it could usually count on dominating its local area, since nearby physicians could conveniently participate in CME courses, and local media would often highlight educational programs in their community. Now, however, the Internet has created a new way of providing physicians and patients with information at very low cost and with unparalleled convenience. In the future, national vendors of health information may ally with professional organizations or elite AHCs, such as Harvard, Johns Hopkins, or the Mayo Clinic and threaten the ability of many academic institutions to compete in the CME market.

The Internet may also reduce AHCs' reputational advantages of being local suppliers of authoritative consumer health information. While web-based services may currently seem improbable competitors with medical schools in teaching undergraduate medical students, other professional schools are already confronting this prospect. At some point, at least the first two years of undergraduate training may no longer be the exclusive province of medical schools as we know them.[26] AHCs also face competition in some cases from the independent entrepreneurial activities of their own faculty, who are

launching their own Internet start-ups to conduct educational and even patient-care ventures.

Still another challenge to AHCs originates in increased federal regulatory oversight of some of their mission activities, especially research. The Department of Health and Human Services has sharply criticized some AHCs for alleged shortcomings in protection of human subjects. This has resulted in the temporary suspension of all clinical research at Duke and the ongoing suspension of gene-therapy trials at the University of Pennsylvania.[27,28] The growing scrutiny of clinical research activities at AHCs, at a time of renewal and growth for these programs, underlines the need for reform in the research infrastructures of medical schools and teaching hospitals.

In recent years, AHCs have devoted the preponderance of their resources and attention to dealing with the first of the challenges noted above: threats to clinical margins and market shares. Therefore, any review of internal reform strategies adopted by AHCs must necessarily devote considerable attention to efforts to improve clinical competitiveness. However, the emergence of CROs and SMOs, the web-based information revolution, and the changing governmental regulatory oversight of research suggest that AHCs can no longer take for granted their preeminence in any of the roles they have traditionally played in society. In the future, their continued participation in activities essential to training physicians and improving the quality and efficiency of health services may require that they radically revise the methods by which they conduct their unique social activities. AHCs may need to produce different types of research and teaching, with greater efficiency and higher quality, than in the past. Thus, we review AHCs' more limited efforts to reform their mission-related activities as well, though, as noted, a full discussion of educational initiatives will occur in a separate report devoted exclusively to this topic.

PART 3. IMPROVING AHC GOVERNANCE AND MANAGEMENT

Whatever challenges AHCs face in the future, their ability to respond capably will be enhanced by effective governance and management. Without these, no organization can hope to cope with an environment as inherently unpredictable and fast-paced as the current health care sector. Achieving effective governance and management in AHCs, however, is particularly difficult because of their unique position at the boundary between the university with its academic norms and culture and the market-based economy that increasingly dominates health care.[29,30]

AHCs were born when universities, responding to needs of medical schools, acquired or developed close affiliations with hospitals. The purpose was to gain control over the quality of care in sites where clinical faculty taught physicians-in-training and other health professionals. This involved universities in the provision of a vital public service—health care—with very different properties than the educational services and research services provided by traditional university departments in the humanities or the physical sciences. Nevertheless, the marriage worked reasonably well and even proved quite profitable financially to universities until the advent of competitive health care markets in the 1990s. At that point, universities found that their owned or affiliated clinical entities—both hospitals and group practices—could be major financial liabilities. To maintain their economic viability, universities would have to manage clinical activities with greater flexibility, nimbleness, and professionalism.

Furthermore, faculty members of medical schools constituted the primary workforce of these facilities. Thus AHCs suddenly found they had to balance the need to provide intellectual freedom and autonomy to faculty engaged in research and teaching with the discipline essential to meet economic threats from competing providers of health care services. In addition, AHCs found that the slow, bureaucratic, deliberative decision-making processes employed by universities were not well-suited for managing health care businesses in a competitive environment.

Organizational challenges to competitiveness were even greater for state-owned universities, whose AHCs often had to get permission from state authorities for initiatives that required capital investments, that created conflicts with state employee unions, or that involved construction in politically sensitive locations. Besides slowing decisions, the requirement for state approval of new programs has sometimes forced AHCs to publicly disclose their plans during legislative and administrative processes. This has revealed the strategies of state AHCs to local private competitors.

AHCs are attempting to deal with these problems of governance and management through a series of reforms that vary with the circumstances of the AHC. All AHCs are also grappling with the long-term need to reform the culture of their institutions and to identify and nurture effective leadership.

Organizational Reforms

Unified clinical and academic governance. A number of AHCs have historically separated the management of their clinical and academic components. Where universities have owned hospitals, hospital directors have commonly reported separately from deans to university presidents and boards of directors. Since deans have generally had authority over faculty, including faculty group practices, such separate reporting relationships have divided hospitals from the clinical staffs who provide physician services. This has complicated the task of formulating and implementing clinical strategies in a rapid and coordinated fashion. More importantly, career incentives of the medical school faculty were not always aligned with the interests of the clinical enterprise.

Several AHCs have attempted to overcome the problem of separate organizational structures by creating a new position within the university—sometimes called a vice president or vice chancellor for health affairs—to whom both clinical and academic managers report.[31,32] Among the AHCs who have taken this step are Duke University, the University of California at Davis (UCD), the University of California at Los Angeles, the University of California at San Diego, the University of Miami, and the University of Michigan.

The central idea is to align the interests of clinical and academic elements of the AHC. The value of this new arrangement obviously will vary with the capabilities of the individual appointed to fill this role and with the circumstances of the university. One concrete example of a positive result is the case of UCD. Prior to the appointment of a vice chancellor for health affairs, the university medical school had, at best, modest coordination with its major teaching hospital, located miles away in downtown Sacramento. This lack of coordination was a distinct disadvantage in one of the most competitive health care markets in the country, which is dominated by a small number of managed care organizations, especially Kaiser Permanente, and several large hospital chains, including Catholic Health Care West and Sutter Health.

After UCD's reorganization, notable changes occurred. Decision-making for the clinical enterprise was vested in a council representing chiefs of service, leaders of UCD's new community network, leaders of the faculty group practice, and hospital executives. At

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least in theory, this made possible a coordinated approach to clinical governance. For the first time, the medical school, the hospital, and UCD's growing community-based network began planning and budgeting together and reported to the same chief financial officer. This teamwork resulted in a joint strategy to create centers of excellence in several clinical and research areas, funded in part by transfers of revenue from the clinical enterprise to the medical school.

The clinical side of the organization accepted the logic that recruiting star researchers and clinicians to the medical school could enhance the reputation of the UCD hospital and improve its ability to compete locally for business. As part of this investment in the medical school, the university is building a new research building on the Davis campus with partial funding from the hospital.

Increasing autonomy for the AHC and/or its clinical enterprise. A number of university- and state-owned AHCs have sought increased autonomy from university and state authorities. Several devices have been identified that AHCs and their parent universities use to accomplish this, including corporate restructuring and/or the creation of separate boards governing the clinical enterprise. Examples of corporate restructuring are numerous, and some precede the current competitive era. The University of Chicago Hospital became a self-governing nonprofit corporation in the 1980s with close links to the university through overlapping boards. The University of North Carolina Health Care System has been separated completely from the University of North Carolina and now reports through a separate board to the state legislature. Similarly, both the University of Maryland and the Oregon Health Sciences University created quasi-public corporations to manage their AHCs.

The Oregon Health Sciences University is in some ways a paradigmatic example of this strategy.[33] Located on its own campus in Portland, OHSU was fully integrated into the University of Oregon. Its status as part of a state agency limited its ability to raise the capital it needed, since it had to get legislative approval for new bond offerings and was required to hold board meetings in public. OHSU persuaded the state legislature to designate it a quasi-public corporation with its own authority to raise capital and with independent decision-making authority. The new entity includes all the health science schools formerly part of the state system, as well as its affiliated clinical facilities. OHSU officials consider their new autonomy vital to competing in the highly competitive Portland health care market.

Another tactic to achieve increased autonomy for AHCs without wholesale corporate restructuring has been to create a sub-board of the overall university board with

special responsibility for providing oversight of AHC affairs. This enables the AHC to receive more detailed and timely attention from university authorities.[32]

Reforms in faculty governance. To paraphrase an old aphorism, one can take the AHC out of the university, but one cannot—and should not—take the university out of an AHC. The professional staff of an AHC is organized and governed as a faculty and imbued with the mores and culture of the university. This creates enormous strengths, for it enables AHCs to attract extremely talented and dedicated scholars and clinicians who enhance the quality and reputation of clinical services and accomplish the unique missions of AHCs.

Given AHCs' need to deploy resources rapidly and efficiently in a competitive health care environment, however, their reliance on a faculty workforce creates significant challenges. Faculties operate by consensus, which creates opportunities for minorities that oppose change to delay it significantly or frustrate it altogether.[34] Furthermore, faculty members are accustomed to substantial autonomy, a requirement for the pursuit of independent, creative work. In practice, autonomy has been assured through rules of employment, such as lifetime tenure, and through governance structures, such as faculty senates and committees, that assure faculty influence over major institutional decisions. As the head of one health science center has put it, "Prolonged debate and 'a thousand points of veto' is a sure path to failure in today's health care marketplace."[35]

Recognizing this, AHCs are struggling to design alternative forms of faculty governance that balance the sometimes conflicting demands of the university culture and the health care marketplace.[30] AHCs are experimenting with new terms of faculty employment to increase faculty accountability to the university and to the clinical enterprise. Reforms include the use of renewable contracts in place of traditional tenure for senior faculty (at Wake Forest School of Medicine, for example), and the delineation of specific faculty responsibilities in letters of employment.[30] Surprising as it may seem, faculty were in the past, and frequently still are, hired without any written agreement on how they will spend their time, how they will be supported, and how long (for untenured faculty) their term of employment is expected to last. This informal approach has created difficulties for deans and department chairs in setting and enforcing expectations for faculty involvement in provision of care, teaching, research, or administration.

Along with laying out expectations of faculty, AHCs also are trying to be more explicit about what faculty should expect from their schools of medicine and hospitals. This includes not just financial support, but also mentorship from specific senior faculty and programs for faculty development.[30]

In addition to changing terms of employment, AHCs are trying to improve mechanisms of faculty management. In the past, department chairs and divisional directors often had major or primary responsibility for organizing the provision of physician services within their disciplines, both inside and outside the hospital. This meant that leaders often chosen for their academic excellence were also required to manage growing, complex clinical services. These requisite skills, however, do not always reside in a single individual.

The independence of clinical chairs also frustrated coordination across different elements of the clinical enterprise. To manage this problem, AHCs are increasingly trying to move responsibility for clinical governance into cohesive structures such as medical groups and physician organizations that represent all the physicians in the organization. This trend is consistent with the move toward "mission management" that is discussed below. Health care leaders hope that these new structures will promote rapid and responsive clinical decision-making. Often, the resulting physician organizations are in turn represented on new decision-making bodies for the entire clinical enterprise—spanning faculty groups, hospitals, community networks, and other elements in the AHC.

An example of this trend is the creation at the Massachusetts General Hospital (MGH) of a Massachusetts General Physicians Organization (MGPO), which is the contracting and clinical governing body for 924 MGH physicians. All physicians are paid by the MGPO, which had revenues of $240 million in 1999, and the physicians also elect a governing council, which must include several academic chiefs of service. The founding director of the MGPO was chief of surgery, but his successor is not a clinical chief of service. The president of the MGPO is an equal partner with the president of MGH in directing that organization's clinical enterprise and sits on the executive committee of the Partners HealthCare System, the decision-making body for the MGH's parent corporation.

In general, AHCs are seeking to streamline governance without losing responsiveness. AHC leaders must develop an organizational structure that includes a small decision-making body acting when appropriate on behalf of the entire AHC, while at the same time maintaining communication with faculty and staff.[35]

Mission management. Still another change instituted by many AHCs has been the deployment of "mission management." The concept of mission management has been well-described in two volumes published recently by the Association of Academic Health Centers.[26,34] This strategy recognizes that AHCs have three major missions or (in the market vernacular) product lines: teaching, research, and clinical care. While these

missions are interdependent and cannot be fully separated in theory, they can at times be separated in practice. In any case, each must be effectively managed in times of tight resources and changing expectations.

A concrete manifestation of the trend toward mission management has been the creation of so-called matrix organizations. This involves appointing individuals at multiple levels of the organization with primary responsibility for each mission, and with dual accountabilities for the overall health of the organizational unit they reside in, as well as the mission for which they are responsible. For example, vice chancellors may have separate assistants for teaching, research, and clinical affairs, while deans, hospital directors, and department chairs may each have assistants for these areas as well. An assistant department chair for clinical affairs will report upward not only to his department chair, but also to the chief medical officer of the hospital and to the assistant dean for clinical affairs. This assistant dean may, in turn, report both to the dean and the assistant vice chancellor for the clinical enterprise. The goal is to create a cadre of managers who are paying attention to the unique needs of each mission without neglecting the needs of the AHC as a whole. A potential drawback, of course, is the creation of increased bureaucracy in the form of a new layer of middle managers. Though the concept of mission management seems long overdue, the value of matrix organizations to accomplish this goal remains untested.

Improved information systems. Like the universities to which they are linked, AHCs have generally adopted the view that many of their outputs—new knowledge, innovation, education—are either impossible to quantify or so difficult to measure that the effort is wasteful at best or damaging at worst. The result is that most AHCs do not have basic information on their core functions: how much money the clinical enterprise provides the academic enterprise to support academic activities; the productivity of faculty and academic units in attracting and using research funds; the faculty teaching loads; the amounts of clinical care that faculty undertake; net revenues by type of clinical service; and the quality of care provided by clinical units and faculty clinicians. Many of these functions are, indeed, very difficult to measure accurately, so AHCs are justified in their caution concerning the development and use of information systems. However, the inability of AHCs to measure their outputs means that they cannot benchmark against other AHCs. Without data on performance by mission, mission management becomes extremely difficult.

Improving information systems is a major challenge for all health care organizations, and that challenge is magnified many fold for academic institutions that

must track multiple missions. Nevertheless, efforts are under way to improve the information available for enterprise and mission management. One example is the Funds Flow Project of the University HealthSystem Consortium (UHC).[36] Working with Ernst and Young, LLP (E&Y) and 14 AHCs, the UHC has been developing a common methodology for tracking the way funds flow among different units of the academic health center: universities, hospitals, medical groups, medical schools, and departments. The goal is to understand who provides and receives funds and services, how much academic missions overall are costing the clinical enterprise, and how much support flows to each of the academic units and services. The next step of the project will be to identify measures of productivity for these units so that managers will be able to benchmark returns on investment from mission-related activities within and across AHCs.[37]

Project leaders hope that increasing numbers of AHCs will participate, providing a robust database for inter-institutional comparisons. Attempts to quantify the output of mission activities in the areas of teaching and research are fraught with peril, since measures of the quality of teaching and research are inexact. Thus, the potential exists to weigh too heavily the quantity of teaching and research output, and underestimate the contribution of faculty and units with smaller amounts of very high-quality academic achievements. However, UHC and E&Y leaders hope that, at the very least, the dialogue between clinical managers and academic leaders will result in common approaches to improving the management of mission activities.

Another more targeted example of improved information systems at an AHC is the computerized Physician Order Entry system (POE) developed at the Brigham and Women's Hospital (BWH) and recently adopted by its sister institution within Partners HealthCare System in Boston, the MGH. With POE, all physicians, including house officers, record all patient care orders on the computer, eliminating the need for transcribing orders prior to forwarding them to support services, such as pharmacy, nursing, and radiology. This system reduces response time and duplication of care (repeated, unnecessary tests) and, perhaps most importantly, enables the identification and prevention of medication errors, such as incorrect dosages, drug interactions, and incorrect choice of medications. Care guidelines can be incorporated into the system, so that physicians are notified if the nature or timing of their orders differs from accepted practice. POE has reduced costs and medication errors at BWH.[38-40] A similar system for antibiotic choice in the intensive care unit of the LDS Hospital in Salt Lake City has produced comparable benefits.[41]

Leadership Development

As important as reforming management and governance at AHCs is the development of a cadre of leaders with the necessary skills to shepherd these complex institutions. Leadership is especially crucial during periods when organizations must change significantly in order to survive and improve, and this is arguably the case for AHCs at the current time. The characteristics of effective leaders in AHCs and elsewhere include: motivation, energy, self-awareness, self-confidence, breadth of perspective, integrity, respect for others, ability to communicate, ability to listen, ability to organize, ability to select good people, ability to handle uncertainty, ability to handle praise and criticism, ability to act and take risk, ability to use power, and ability to make difficult decisions.[35]

It is, of course, much easier to list this set of attributes than to nurture and identify them within a particular AHC, or within the AHC sector as a whole. Though AHCs are magnets for talent, they generally attract and retain individuals who excel in clinical care, research, or education. Many of the required characteristics for modern organizational leadership do not figure in the deliberations of most academic promotion committees. Often, however, AHCs look first to their faculties for potential leaders, since these individuals have credibility and legitimacy with the academics who make up such an important component of the workforce. To complicate the search for AHC leaders, the mid-level management positions that constitute the training ground for future leaders are often disdained by academics, who discourage talented young people from taking them. Management is still often regarded as something that academics do when they can no longer "cut it" as investigators or clinicians.

Not surprisingly, therefore, AHCs have generally done little if anything in a formal sense to prepare young people for leadership roles or to prepare for succession to senior positions, such as deans, department chairs, or vice chancellors. Another reason for this lack of preparation is that the concept of succession planning may conflict somewhat with a standard approach to attracting academic talent within at least some AHCs: the national search. When an academic job becomes available, faculties traditionally search far and wide for the best qualified person to fill that position. The implicit assumption is that what counts most is the intellectual firepower of the individual. How well they will fit in the organization, their understanding of its culture, or their interpersonal skills are important but secondary considerations. This approach may work fine in academic searches, but in finding AHC leaders—where intangible personal attributes are so critical—it may be far from optimal, and must be balanced by conscious efforts to develop internal talent and to plan systematically for succession. Few AHCs, if any, have adequately addressed these challenges.

In this regard, AHCs may benefit from the example of the country's major corporations, which often devote years to planning succession for critical leaders. An example is the long, careful effort to prepare for the retirement of the nearly legendary chief executive of the General Electric Corporation, Jack Welch.[42] In this study, no AHCs were discovered to be devoting comparable effort to preparing for the retirement of senior leaders.

PART 4. REFORMING THE CLINICAL ENTERPRISE

AHCs have devoted more energy and resources to reinventing their clinical activities than to revising any of their other major missions or product lines. Success in clinical markets is obviously vital to AHCs' missions in the areas of teaching, research, and innovation in patient care. For purposes of discussion, we group AHCs' clinical reform initiatives into two categories: those designed primarily to protect clinical volumes and market share, and those intended primarily to decrease clinical costs. Though it is convenient to divide AHC clinical activities in this way, the reader should be aware that the distinction is somewhat artificial: increasing clinical volume can decrease expenses by spreading fixed costs over a larger volume of activities, and cutting costs can enhance volume and market share by enabling AHCs to reduce prices and compete more effectively in price-conscious markets.

Strategies to Increase Volume and Market Share

Developing primary care capabilities. For a number of reasons, maintaining a capacity to provide primary care is vital to AHCs. First, loyal primary care providers are a source of referrals to maintain inpatient volumes. Though complex tertiary care referrals occur uncommonly in primary care practice, the great bulk (80–90 percent) of hospitalizations at university teaching hospitals are for secondary or common tertiary care problems.[43] Without access to a continuing flow of such patients, the financial viability of AHC clinical facilities would be severely jeopardized. Second, AHCs need to be able to teach medical students and residents how to provide primary care. This requires that they have faculty practitioners who can offer clinical instruction and community-based sites where trainees can treat primary care patients under faculty supervision.

The advent of managed care and the gatekeeping model of primary care posed a very distinct threat during the mid-1990s to AHCs' relationships with primary care physicians and their patients. Physicians feared that their primary care contracts with managed care organizations would require them to direct patients to lower-cost community hospitals and away from AHCs. Primary care physicians (PCPs) who shared financial risk for their patients with managed care organizations would have additional motivation to avoid high-priced AHC facilities.

Recently, AHCs have experimented with several approaches to maintaining a primary care capability and/or sound relationships with primary care physicians. Three paradigmatic strategies include the assembly strategy, the acquisition strategy, and the affiliation strategy.[44] In the first, an AHC hires primary care physicians as faculty and members of its faculty group practice. These physicians participate in clinical activities, but also in research, teaching, and administration within the AHC. In the second strategy, AHCs develop a network of primary care practitioners by purchasing their practices

and/or employing them, thus creating a wholly owned primary care system that sends patients largely or exclusively to the academic health system. The University of Pennsylvania Health System, for example, has aggressively pursued this strategy. A variant of this approach was pursued by Pennsylvania State University Medical Center at Hershey when it merged with the nearby Geisinger Clinic, a large multispecialty group practice with substantial primary care capability. The latter arrangement was recently dissolved because of cultural and financial conflicts.

In the affiliation approach, an AHC develops contractual relationships with independent PCPs, usually independent practice associations (IPAs) or large groups who agree to form a special relationship with the academic health system. Those relationships may vary greatly. They may consist of joint contracting with managed care organizations or of an agreement by the PCPs to refer certain types of patients at a specified cost. The latter is especially useful for PCPs who are financially at risk for the costs of their patients' care. An example of the contracting approach is the relationship between the University of California, San Francisco (UCSF) and the Brown-Tolland Group, an IPA in the San Francisco Bay Area. Brown-Tolland agreed to send its specialty care business to UCSF as long as prices and services at the AHC were competitive with other providers in the market. In return, the IPA hoped that that its association with UCSF would enhance its brand name and attract additional patient volumes.

Most AHCs have pursued a mixed approach in which they purchase some PCP practices and employed some PCPs, but also contracted with other IPAs and groups. Examples include the Partners HealthCare System in Boston, the University of Chicago Hospitals in Chicago, and University of California at Davis in Sacramento. The Partners HealthCare System, through an affiliated corporation called Partners Community HealthCare Incorporated (PCHI), has relationships with over 1,000 primary care physicians for whom it negotiates capitated contracts with third parties in eastern Massachusetts. PCHI purchased the practices of about a quarter of these PCPs, but for the balance has affiliation agreements.

None of these strategies is without problems. The assembly strategy is relatively slow and burdens PCPs with the demands of AHC faculty, thus reducing their clinical efficiency. Purchasing practices and turning PCPs into employees, as some AHCs have done, has proved extremely expensive ($50,000 to $200,000 per physician practice) and has entailed large operating costs as formerly lean community practices become encumbered with AHC overhead. Newly employed PCPs have also displayed lower productivity in some cases since they are no longer responsible for assuring their own incomes. The Allegheny Health System, University of California, San Diego, and the

University of Pennsylvania are examples. Partners HealthCare System mitigated this difficulty by purchasing the fixed assets of practices and then required PCPs to continue to generate their own salaries through practice income.

An additional problem is that some AHCs are thought to have substantially overpaid for primary care practices during the initial frenzy to sign up PCPs in the early and mid-1990s. More flexible affiliation agreements have problems of their own. Many AHCs have found that affiliated PCPs have minimal loyalty to the AHC, refer fewer patients than was hoped, and use the threat of defection to extract additional concessions over time.

The challenge facing AHCs (and non-academic health care organizations trying to build integrated health care systems) is to create links to affiliated physicians and health care organizations that bind them in a meaningful way to the AHC, but do not undermine the entrepreneurial spirit of the PCPs. Fundamentally, this means creating mutual bonds of self-interest. Like non-academic health systems, AHCs are experimenting with a number of approaches to creating meaningful ties to affiliated PCPs. A demonstrated ability to negotiate payment rates for PCPs that are higher than market averages is one important potential source of cohesion within networks. A second is the provision of price discounts for obtaining specialty services for which PCPs are at risk. Another source is provision of administrative services that have clear value for PCPs. These may include information systems that support patient management and coordination of care. The University of California, Davis, for instance, is attempting to provide specialty consultation services through a telemedicine service for rural PCPs in the Sacramento Valley.

Partners HealthCare System is developing an intranet capability, PCHINET, that will offer community-based physicians electronic access to patient information generated elsewhere in the Partners system, e-mail access to one another and to downtown specialists, medical decision-support tools such as disease management protocols, and other services. If academic health systems eventually seek accreditation through the National Committee for Quality Assurance or other sources, the system's ability to facilitate the required data collection and administrative support offers another potential benefit to community participants, assuming that accreditation adds to the market power of affiliated physicians. Whatever the strategies AHCs use to build their primary care networks, the process will be facilitated by the presence of strong external threats in the form of powerful and cost-conscious health plans and/or competing health systems.

In building loyal networks, AHCs face challenges that some non-academic systems may not. Because AHCs attract patients with complicated illnesses, differences in severity of illness may be substantial between patients seen in teaching institutions and those seen in affiliated hospitals and PCP practices. These differences may make AHC patients more expensive to care for than patients in their affiliated networks. When the AHC and its network are paid on a capitated basis, however, paying the AHC more for services means paying its affiliated community physicians less, and the resulting tensions may split the network. No AHCs have yet devised effective solutions to this problem. The answer may lie ultimately in convincing payers to provide higher capitation rates (by risk adjusting payments) to AHC networks in recognition of the sicker-than-average patients that AHCs attract. The success of this strategy depends ultimately on convincing employers to pay higher premiums for managed care plans that include AHCs in their networks and use them extensively.

At the same time, some AHCs also have advantages in network development that competing non-academic institutions may lack. Especially in states with only one AHC, many community-based physicians will have trained in the AHC's medical school and teaching hospital, and may have personal contacts with specialists at these institutions. The Oregon Health Sciences University, for example, has relied on graduates of its medical school to build a network of rural PCPs in Eastern Oregon.

The future role of primary care within AHCs is now under debate. Some commentators feel that efforts to enhance primary care capabilities within AHCs will prove to have been a mistake, since managed care has been unable to restrict patients' choice of provider. In addition, the influence of primary care physicians within the health care system is once again declining.[44] Whether this judgment will prove accurate depends to a large degree on how the health care system deals with the likely escalation in health care costs that will follow the retreat of managed care. If the new paradigm assigns an important role to PCPs, AHCs may find themselves well-served by recent efforts to enhance primary care capacity, especially those strategies that did not involve huge capital outlays. In any case, AHCs will need to fashion a continuing relationship with the primary care sector to meet their teaching and research responsibilities.

Protecting specialty care market shares. Rushing to develop primary care capabilities at the dawn of the competitive health care era, some AHCs lost sight of the importance of their specialty care missions. Panicked over their lack of primary care capability, they invested heavily in developing primary care networks and reduced their investment in developing specialty care capabilities. Subsequent experience has demonstrated, however, that high technology and specialized services often provide significant advantages to AHCs

in local markets.[5] When AHCs are the sole or dominant provider of such services, they are sometimes able to negotiate very favorable payment rates. An example is the University of California at Davis, which has the only Level I trauma unit in the Sacramento Valley. This designation has enabled the AHC to get very generous reimbursement for trauma services—those margins generate 80 percent of the teaching hospitals' clinical margins. The reputational advantages associated with providing high-end services also provide negotiating leverage with managed care organizations that sometimes cannot afford to exclude AHCs from their networks.

In a number of markets, AHCs face significant competition from non-academic providers of specialty care. The University of California, San Diego competes against Scripps Health System, which offers high-end services and is affiliated with the prestigious Scripps Institute, an internationally recognized performer of biomedical research. In the Washington, D.C., market, Georgetown Medical Center and George Washington University Medical Center compete with Fairfax Hospital, a tertiary care provider in nearby Fairfax, Virginia, and with Medlantic, a nonprofit health system in Washington. The University of California, Los Angeles competes with the Cedars–Sinai Hospital.

More commonly, however, AHCs find themselves competing with sister academic institutions for high technology and specialized services. This competition is especially prevalent in the Northeast, Mid-Atlantic, and Midwest, where major metropolitan areas such as Boston, Chicago, New York, Philadelphia, and St. Louis contain multiple AHCs. One strategy that AHCs in some of these markets have pursued to improve their market position in high technology and specialized services has been to merge their teaching hospitals, thus effectively reducing the level of competition for specialty services.[6,43] Examples of such mergers include: 1) in Boston, the Massachusetts General Hospital and the Brigham and Women's Hospital; the Beth Israel Hospital and the Deaconess Hospital; the University Hospital and the Boston City Hospital; 2) in New York City, the Mount Sinai Medical Center and the New York University Medical Center; the Columbia Presbyterian Hospital and the New York Hospital; 3) in Philadelphia, the Hahneman Hospital and the Medical College of Pennsylvania; 4) in St. Louis, the Barnes Hospital and the Jewish Hospital; and 5) in San Francisco, the University of California San Francisco Medical Center and the Stanford University Medical Center. A number of these mergers have involved institutions affiliated with different medical schools, but faculty have generally resisted parallel combinations of medical schools. In only one case (Hahneman and the Medical College of Pennsylvania) have medical schools merged, and faculty dissent played a major role in the recent breakup of the University of California San Francisco Medical Center–Stanford hospital relationship.

These hospital mergers have had a number of purposes other than assuring specialty market share. Thus, their track records cannot be judged solely on the basis of their success in securing high technology and specialized business. In any case, it is early to judge the success or failure of the merger strategy in this regard, since most are less than three years old at this writing. Two have failed, but in neither case can the downfall be clearly attributed to the failure to secure increased tertiary market share.

The Medical College of Pennsylvania–Hahneman merger was arranged after both institutions became part of Pennsylvania's Allegheny Health System, and the Allegheny Health System as a whole went bankrupt in 1998. The merged teaching hospitals of the Medical College of Pennsylvania and Hahneman were acquired by the for-profit Tenet Health System, while the merged Medical College of Pennsylvania–Hahneman Medical Schools became affiliates of Drexel University. The University of California San Francisco Medical Center–Stanford merger is in the process of dissolution after Stanford University decided to pull out. This decision was a result of Stanford University faculty dissatisfaction after the announcement of unexpected operating losses during the first full year of the merger. At least one other merger, the Beth Israel and Deaconess Hospitals, has been troubled by faculty dissension and defections and by substantial operating losses. In contrast, both the Barnes–Jewish and Massachusetts General Hospital–Brigham and Women's Hospital mergers have proceeded relatively smoothly, and evidence exists that the latter merger has enhanced the market shares of these institutions.

AHCs are pursuing other strategies to enhance their tertiary care market shares as well. They are negotiating relationships with community hospitals and community-based medical groups in which AHC specialists provide on-site services in the hope of attracting cases that cannot be managed at local institutions. The University of California, San Francisco (UCSF) has developed an aggressive marketing strategy in which representatives of its medical center are assigned particular medical groups that sell designated UCSF product lines (such as liver transplants or coronary artery surgery). UCSF representatives negotiate long-term contracts with these groups and also compete for business in the "spot market" for tertiary services.

A fundamental problem that AHCs have not yet solved is how to balance the competing interests of specialists based in academic centers and in community-based practices. AHCs are often oversupplied with specialists who avidly seek cases that non-academic specialists treat. However, many of the PCPs in AHC networks have long-standing relationships with local specialists and wish to continue referring to these colleagues. Some AHCs have pondered the development of specialty care networks to

complement their PCP networks. Those networks sometimes take the form of local "carve-outs" that market their services directly to managed care organizations.[46] Examples are cardiac disease carve-outs that care for congestive heart failure and other conditions and asthma carve-outs. So long as such carve-outs consist of academic specialists, they may help AHCs retain volume in the specialty arena. If those networks contain substantial numbers of non-academic specialists competing with AHC physicians, however, the prospects of an enduring alliance seem remote.

Building integrated delivery systems. A number of AHCs that have pursued mergers, primary care networks, and specialty care strategies have sought to weave these elements and others into an integrated delivery system (IDS). In its ideal form, an IDS offers a complete or nearly complete continuum of care, from basic primary care services to hospital care to rehabilitation to nursing home and home care services.

The concept of the IDS was very popular in the early to mid-1990s and seemed a way to accomplish multiple objectives: the protection or enhancement of market share from community-based referral sites; the development of sufficient market power to negotiate effectively with third-party payers; improved efficiency of care by allowing patients to be cared for in the least-cost site; and improved quality of care by enhancing coordination.

AHCs have developed IDSs through two methods: they assembled the building blocks themselves through acquisition and affiliation, or they merged with other non-academic health systems that provided many of the critical elements—especially a disseminated network of primary and specialty care physicians.

The former strategy has been used by Caregroup, Duke University Medical Center, Partners HealthCare System, and the University of Pennsylvania, among others. The latter has been used by Pennsylvania State University Medical Center at Hershey, which merged with the large Geisinger Clinic, a nearby multispecialty group practice with branches over a large swath of western Pennsylvania; and Dartmouth Medical Center, which merged with the Lahey Clinic, a Massachusetts-based multispecialty group that owns a hospital as well.

Though it is too early to assess definitively the track record of the IDS strategy, some lessons are emerging. The IDS remains conceptually appealing, but practical problems of implementation have proved formidable. The University of Pennsylvania is in deep financial trouble, and the Penn State–Geisinger and Dartmouth–Lahey mergers have

both been dissolved. The creation of an IDS has proved a costly and difficult challenge for all providers that have attempted it, academic and non-academic. For systems that include or are based upon AHCs, the cultural clashes between academic leaders and physicians and their community-based partners have only added to the inherent challenges of creating an IDS. Those challenges include limited management resources; limited capital and talent to support the information systems critical to binding the IDS together and creating real coordination of care; and failure of managed care to develop as far and as aggressively as providers anticipated, thus reducing the external threat that brought disparate health care institutions together. The failure of capitation to spread in many markets has also prevented AHCs from realizing the potential of IDSs to realize economic gains by placing patients in the least-cost site of care.

In reaction to these challenges, the IDS strategy is in retreat among AHCs and other health care providers as well. It seems unlikely to be revived in the near future unless AHCs find access to new sources of capital, and unless substantial managed care or some equivalent threat reappears in their local environments.

Strategies to Improve Efficiency and Reduce Costs

Virtually every AHC struggled to reduce its costs during the 1990s. These struggles involved using techniques familiar to other health care institutions and other industries.

First, they reduced the size of their physical plants and their staffs, closing beds and/or laying off employees.[47,48] In some cases, AHCs facing operating losses employed consultants, such as the Hunter Group, who assisted them in dramatic staff reductions of 20 percent or more. Examples of such large downsizings include the New England Medical Center; the University of California, San Diego; the University of Pennsylvania; and the University of California, San Francisco. The latter's Moffet-Long Hospital recently closed its Mount Zion Hospital branch to staunch losses at that facility.

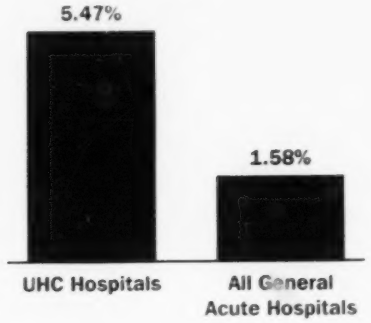
Second, AHCs have sought to redesign clinical processes to cut costs. Using techniques imported from other industries, including process reengineering and continuous quality improvement, AHCs have assembled groups of internal process improvement experts to spearhead these efforts. The Operations Improvement Process at Massachusetts General Hospital is a case in point, but virtually every AHC has adopted some version of process improvement. In a national survey of AHC faculty in 1996–97 a substantial proportion reported that in the previous three years they had increased the amount of research they did in such areas as quality improvement, clinical epidemiology, and health services research. Faculty in competitive markets were significantly more likely

to report increases in such activities than faculty in non-competitive areas. These are the types of activities that tend to go on in the process of clinical process redesign.

Third, AHCs have pursued major clinical restructuring, such as mergers and the development of IDSs, in part for the purpose of facilitating cost reductions by enabling the consolidation of administrative services across hospitals and other clinical facilities. Whether mergers and IDSs have succeeded in this goal remains unclear. In some cases, such as the controversial UCSF–Stanford merger, the opposite seems to have occurred. Partly to create and upgrade common information systems, this combination resulted in the addition of 1,000 staff members between the two institutions. This increase led to unanticipated losses that eventually doomed the merger. All mergers have resulted in the addition of some corporate staff, and balancing these additional costs against savings resulting from consolidation of other functions, such as human resources and finance, requires independent careful audits that have not been conducted outside of UCSF–Stanford.[49]

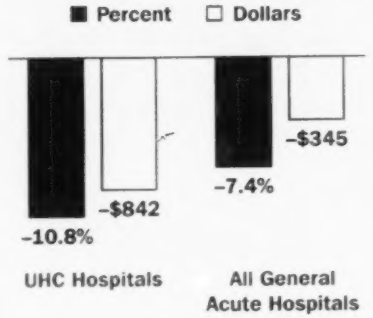
Overall, data from the University HealthSystem Consortium (UHC) suggest that the clinical enterprises of teaching institutions have enjoyed some success in reducing their costs throughout the 1990s. From 1994 to 1997 the average case mix index (CMI) among members of the UHC increased 5.47 percent compared with an increase of 1.58 percent among all general acute care hospitals in the United States (see Figure 1). However, when adjusted for inflation and CMI, the cost per discharge decreased 10.8 percent for UHC hospitals compared with a 7.4 percent decrease for general, acute care hospitals (see Figure 2). These reductions in the average cost per case translated into an $842 decrease for UHC members and a $345 decrease for all acute care hospitals.

Figure 1: Total Change in Case Mix Index (CMI), 1994–1997



Source: University HealthSystem Consortium data, 1997.

Figure 2: Total Change in Inflation and CMI-Adjusted Cost/Discharge, 1994–1997



Source: University HealthSystem Consortium data, 1997.

A number of individual success stories exist as well. The University of California, Los Angeles has reduced dramatically the differential between its cost per case-mixed adjusted discharge and that of their non-academic competitors—from 30 percent to 13 percent.

It is unlikely, however, that AHCs will ever be able to compete with non-academic institutions solely on the basis of price, unless they reduce some of their mission-related activities. Unpublished work by the Lewin Group for The Commonwealth Fund Task Force on Academic Health Centers has demonstrated that, after controlling for case mix, local prices, hospital size, and other variables, AHC participation in teaching, clinical research, and provision of high technology services seems associated with substantial increases in the cost per discharge at major teaching institutions compared with community institutions.[50] Furthermore, the effects on mission activities of major and dramatic cost reductions remain to be fully assessed.

Strategies to Reduce Dependence on the Clinical Enterprise

Several AHCs have decided to substantially reduce their involvement in clinical activities by selling or otherwise distancing themselves from their teaching hospitals.[47,51] In most cases, university and medical school officials have decided they cannot manage a complex health care business in a competitive environment and that potential losses from that business threaten the long-term health of the university.

The best examples of this strategy are the sales of AHCs to nonprofit and for-profit hospital chains. Among the institutions who have made this choice are:

1. Creighton University, which sold its major teaching facility to the AMI (now Tenet) Hospital System (subsequently repurchasing a minority interest in the facility).

2. George Washington University, which sold a controlling interest in its hospital to Universal HealthSystems.

3. St. Louis University, which sold a controlling interest in its hospital to the Tenet Hospital System.

4. Tulane University, which sold a controlling interest in the Tulane Medical Center to Columbia/HCA.

5. The University of Minnesota, which sold its hospital to the nonprofit Fairview Hospital System.

The long-term consequences of these sales remain to be fully evaluated. A detailed examination of three examples (Creighton, George Washington, and Tulane) showed no short-term adverse effect on the academic missions of the involved AHCs [47] Unique circumstances, however—in each case these were the first purchases of AHC hospitals by the for-profit chains—make generalizing from these experiences difficult. All three institutions enjoyed improved financial performance under for-profit management. An unavoidable (indeed, a desired) result of this AHC strategy is to reduce academic control over the settings in which two major academic activities, research and teaching, take place. A number of AHCs have managed to maintain academic excellence in less turbulent times without control over their clinical enterprises. In these cases, medical schools have long-standing though often informal affiliation relationships with independently owned and managed teaching hospitals. Examples include Columbia, Cornell, Harvard, and Yale Universities and the University of Chicago. Some of these relationships, however, have become troubled as a result of fiscal pressures and reorganizations among the hospitals, and none have involved for-profit partners until recently.

PART 5. REFORMING THE RESEARCH ENTERPRISE

Substantial recent increases in National Institutes of Health (NIH) budgets are likely to prompt impressive growth in the research enterprises of AHCs. These institutions receive nearly 70 percent of their funding from the federal government.[2] This growth—together with the enormous success of the research enterprise—is likely to create the impression that research missions are immune from the recent turmoil affecting AHCs. Important challenges for these missions remain, however.

First, the growth in federal support of NIH funding does not relieve AHCs of dependence on clinical revenues for support of their research missions. Most researchers accept[52,53] that in biomedicine and other areas, federal funds rarely cover the full costs of conducting federally sponsored research.[2,7] AHCs have traditionally supplemented federal funding with income from clinical revenues. Federal shortfalls occur for several reasons: grants are usually cut during the review process and thus cover less than the full direct costs of projects, federal salary caps are well below actual salaries of senior physicians who apply for funds, and grants exclude support for some administrative staffs, such as secretaries.[2] Therefore, expansion of federal research funding may place greater financial burdens on the clinical enterprises of AHCs.

Second, to remain competitive in attracting talented research staff, AHCs must often offer large recruitment packages that include funds to hire faculty and support staff, to renovate laboratory space, and to build new research infrastructure. These monies must come from non-federal research sources, since the federal government supplies virtually no money for capital or infrastructure other than the indirect costs that accompany grants. In addition, indirect costs cover only documented expenditures associated with existing research grants.[2]

Third, the requirements for successful research efforts are changing, so that even in the absence of turmoil in clinical markets, AHCs would be forced to reform their research enterprises. These scientific challenges include the need to compete with for-profit performers of research (CROs); the need to foster interdisciplinary research, clinical research, and health services research; and the requirement to manage increasing links to industrial research partners.[2,54]

Responses to these several challenges have varied. They can be grouped into two categories: efforts to attract research funds from sources other than the federal government or the clinical enterprise, and efforts to improve the management of research, including the efficiency with which research funds are utilized.

Attracting Alternative Sources of Research Funds

Industrial research support. To supplement federal funds, AHCs actively pursue industrial funding. When federal support was more limited, industrial funding was often seen as a substitute for federal monies.[55,56] Industry continues to function in this manner, since companies will often fund applied research that the NIH will not.[57] In addition, however, industrial research funds now help to cross-subsidize underfunded NIH projects. In a recent series of interviews and focus groups with clinical researchers around the country, Task Force investigators were frequently told that clinical researchers use generous industrial funding of clinical research to foot the bill for underfunded NIH projects.[58]

Attracting industrial research funds is encouraging AHCs to adopt a number of new strategies. One is the creation of internal equivalents of CROs. The best example of such an activity is Duke University's Clinical Research Institute, which has become a very large nonprofit, university-based CRO, employing 500 personnel and a budget of $140 million. A number of other organizations have created clinical trial units, which are intended to identify industrial research opportunities and to facilitate negotiations with sponsors. A study by the newsletter "Centerwatch" suggests that in AHCs with clinical trial units, growth of industrially supported clinical research has accelerated.[59]

In some cases, mergers and primary care networks have facilitated research relationships with industry. Partners HealthCare System was able to attract funds from Merck-Medco, the pharmaceutical benefits management company, to develop disease management pathways. A key factor in the relationship was Partners' ability to offer its 1,000-member primary care network as a laboratory for experimenting with those pathways. Furthermore, by combining the research groups at Massachusetts General Hospital and Brigham and Women's Hospital, Partners HealthCare System has become an even more attractive partner for basic research agreements with industry. It has recently used the appeal of its $420 million annual research budget to catalyze two new relationships with two local Massachusetts biotechnology companies, Genzyme and Millennium Pharmaceuticals. These companies, like many pharmaceutical firms, are attracted to AHCs with a large reservoir of federally funded research, which can be transferred into products for commercial partners.[60]

Commercializing research results. Since the mid-1980s, universities and AHCs have consciously pursued opportunities to market the results of their federally sponsored research and thus earn unrestricted income for academic purposes. The commercialization of biomedical research results dates to the 1920s, when the Wisconsin Alumni Research Foundation was founded to license the University of Wisconsin's patent for using

irradiation to activate Vitamin D in foods.[61,62] With the biotechnology revolution of the 1970s and 1980s, however, opportunities for AHCs to generate revenues from intellectual property exploded. The Bayh-Dole Act of 1980, which granted ownership to universities of intellectual property arising from federally sponsored research, also helped to lay the foundation for a surge in efforts by AHCs to commercialize their work.

Virtually every major AHC now has a technology transfer office that works with faculty to patent their intellectual property and to market those patent licenses to companies in return for various financial considerations. These may include royalties from licensed products, consulting income to the faculty member, research support, and equity positions in the company or in potential new start-ups. One of the most successful examples is Stanford University's patent on the original Cohen-Boyer technique for recombinant DNA technology, which started the field of biotechnology. Stanford University earned as much as $30 million a year in royalties while the Cohen-Boyer patent was still in force, much of it from this single piece of intellectual property. Unfortunately, such lucrative properties are relatively rare, and few AHCs can claim Stanford's success.[55,56,63] The Duke experience is more representative. From 1990 to 1996, the number of patents issued to the university increased annually from 7 to 37, the number of license agreements from 19 to 27, and net income from royalties and other sources from 0 to $7.5 million.[7]

Reforming Research Management

Changes in the AHC environment are raising questions about whether AHC missions can be better managed than in the past. Traditionally, the research mission has been managed less intensively than the clinical mission, both because fewer resources were at stake and because faculty and AHC leaders regarded research as to some degree unmanageable. They saw it more as a creative endeavor that would be damaged by efforts to control or direct it. Now, however, the combination of resource scarcity and price-sensitive competition is causing AHCs to focus more energy on improving the management of research. These efforts take a number of forms.

Resource management. Several AHCs have recently undertaken their first formal strategic planning activities for biomedical research. Examples include Duke University Medical Center and the University of California, San Diego. Though strategic planning for programs receiving tens or hundreds of millions of dollars annually hardly seems a major innovation, it is a drastic change from the past. AHCs have been reluctant to undertake such exercises because managers and faculty tended to view research as a spontaneous and unpredictable activity that had to be left to follow its own path. AHCs, however, have also been forced to recognize that success in competition for research funds

increasingly requires investments in infrastructure that is shared among research groups: animal facilities, information systems, DNA sequencing equipment, and so on. Investments in such core facilities require that resources be husbanded, rather than expended on uncoordinated faculty requests. The development of research infrastructure also requires choices among alternative investments, which forces leaders and faculty to decide in advance where research is likely to go in the future. Thus, there is a need for strategic planning.

Some AHCs have also sought to improve the management of their research infrastructure.[28] Space allocation has been haphazard at best in many AHC research programs. Research space was often allocated based on private deals between administrators and powerful faculty. Since power in AHCs often flows from ability to generate clinical revenues, research space was not always allocated according to the merit and productivity of the research likely to be conducted in that space. Once allocated, there were no processes for taking space back from unproductive researchers, especially when they were protected by important clinical chiefs.

Scarcity has forced AHCs to reevaluate this traditional approach to space allocation. In the Massachusetts General Hospital, for example, decisions about space are now made by an Executive Committee on Research (ECOR), which consists of leading faculty scientists and relevant research managers. A professional staff conducts an ongoing space inventory and tracks indicators of how productively space is used. One measure of productivity is research density: the amount of indirect costs collected per square foot of space by each research group in the institution. Space is allocated based on ECOR's assessment of the merit of the research and research density, which indicates the ability of the researchers to fund their space. When research density falls below a certain standard, space may be reclaimed and reallocated.

AHCs are also examining ways to take advantage of changes in the nature of science. Scientific discovery is increasingly interdisciplinary, requiring cooperation among investigators with diverse interests: molecular biologists, x-ray crystallographers, computer scientists, biochemists, statisticians, geneticists, and clinicians. At the same time, individual fields are getting increasingly specialized. To overcome disciplinary boundaries, AHCs are trying to catalyze the development of multidisciplinary research centers. Examples include programs in neurobiology and genetics at Duke University, and the Cancer Center at Mount Sinai Medical School. Unlike many such centers, the Mount Sinai program has appointing powers, enabling it to promote researchers academically outside their traditional departments. This is vital to attracting the loyalty of young researchers to interdisciplinary groups.

Management of clinical research. A number of recent reports have documented the importance of clinical research in the United States at the current time, and the nation's relative under-investment in such research.[2,54,64] Researchers increasingly acknowledge that AHCs bear some responsibility for that under-investment, and, more importantly, that reforms in AHCs will be required if clinical research is to prosper in the future.

Problems and proposed solutions concerning AHCs' past management of clinical research enterprises include the following:

1. AHCs have insufficiently valued clinical researchers. In the past, clinical researchers have often felt like second-class citizens, especially within elite AHCs. They have been promoted less rapidly than laboratory-based fundamental investigators and have often had more trouble than basic science faculty in gaining access to discretionary research resources, including space and money.[2,54] The result is that young physicians lack sufficient numbers of role models of happy, successful clinical investigators and are discouraged from entering clinical research as a career.[64] Conscious attention to cultivating and promoting clinical researchers within AHCs will be required to overcome this problem.

2. AHCs have not devoted sufficient attention to management of clinical research activities. Clinical research projects pose greater and different management challenges than basic research.[2,28] These clinical projects include development of appropriate informed consent procedures; processing by institutional review boards (often in more than one institution); overcoming obstacles to patient recruitment; and the assurance of data quality collected in clinical settings, often in multiple institutions.

Some studies have found that university hospitals are less efficient in managing some of these challenges than are community hospitals and physician offices that participate in research. In addition, CROs have marketed their services to pharmaceutical companies in part on the basis of their ability to speed up and improve the quality of clinical research that was previously conducted in AHCs.[2] As noted above, a number of AHCs have begun to address these problems through such devices as the creation of internal clinical trial units and CROs. However, further changes may also be required. These will include improved training for researchers and research managers in how to organize and manage clinical research projects, and consolidation, streamlining, and improved staffing of institutional review boards.

Management of industrial relationships and conflict of interest. As AHCs cultivate industrial relationships and streamline their research processes, they will have to remain vigilant with respect to risks associated with industrial research support. These risks flow from dependency on industrial research support, which may make researchers more agreeable to restrictions on data-sharing, and conflicts of interest that develop when researchers acquire a financial interest in the outcome of research projects. The well-documented consequences of these influences include a tendency toward increased secrecy among researchers with industrial research funding or who are engaged in commercializing their own research, and a tendency of industrial research support to emphasize more applied, short-term projects, thus directing research away from more fundamental investigation.[56,57,62] Health care leaders are also concerned that conflicts of interest on the part of researchers will jeopardize public trust in the academic research enterprise, thus putting federal support of research in jeopardy over the long term.[65,66]

Little systematic information exists about whether and how AHCs are responding to these real and potential effects of industrial relationships. It is probably accurate, however, to say that such relationships are increasingly common and that AHCs are growing more flexible and tolerant of them over time. For example, except for Harvard Medical School, few elite AHCs prohibit faculty from holding equity in a company while simultaneously conducting clinical research that may increase the value of the faculty member's holding. Nor is disclosure of faculty financial interests routinely required.

AHCs need to consider more carefully the manner in which they manage industrial relationships and beware of conflicts of interest so as to minimize the risks of such arrangements in the future. Both ethical and practical reasons exist for managing conflicts of interest more carefully, especially in the case of clinical investigation involving living human subjects. Ethically, questions arise about whether clinicians caring for patients during clinical experiments should have major financial stakes in the outcomes of those projects. In principle, such financial interests are not qualitatively different from situations in which non-research clinicians have financial interests in hospitals or labs to which they may refer patients. These latter conflicts are illegal under Medicare law.

From a practical standpoint, failure to supervise conflicts of interest more closely is likely to create legal and public relations problems for AHCs that will, at best, complicate the management of clinical research, and at worst, jeopardize public trust in AHCs. The federal government has become increasingly vigilant in the enforcement of guidelines for the protection of human subjects of research. These efforts have revealed flaws in the implementation of such guidelines and resulted in highly publicized suspensions of research programs at leading universities. The associated investigations and press coverage

are bound to shine a spotlight on situations in which clinical research leaders have financial interests in the outcomes of research involving human subjects.

Though federal regulations currently require that researchers receiving federal funds disclose such conflicts to their universities, AHCs have variable and porous rules for managing such conflicts. AHCs may also not require disclosure by researchers supported by non-federal sources. As conflicts of interest associated with industrially supported research relationships receive increasing publicity, AHCs will be forced to adopt tighter regulations in order to assure research subjects that they will not be victimized. If they take such measures in advance, academic centers may be able to avoid the associated negative publicity, which may complicate efforts to recruit research subjects and may lead legislators to impose more onerous external regulation.

A minimum first step in monitoring conflicts of interest involving clinical research is disclosure by research faculty of their interests in outside companies. A second step involves setting limits concerning the acceptable nature and size of such interests on the part of faculty conducting research on human subjects. A third step consists of creating mechanisms to review inevitable cases that are ambiguous or raise special issues.

In their attempts to confront these necessary reforms, AHCs would benefit greatly from formally sharing experiences and attempts to make cross-institutional rules more consistent. Not only would such sharing reduce the learning curve for each AHC, it might also reduce pressures on AHCs to loosen rules in the competition for talented clinical staff. AHCs with less restrictive guidelines on conflict of interest enjoy an advantage in the recruitment of clinical researchers, since those researchers can, in effect, enjoy higher incomes at such less vigilant AHCs. This advantage creates pressures on AHCs with more restrictive rules to soften them, and creates a downward spiral toward more and more tolerance of conflict of interest.

PART 6. SUMMARY AND CONCLUSIONS

Many AHCs have changed the way they are governed and managed. A number have tried to consolidate leadership under a single academic and clinical leader in order to better align the incentives and behaviors of faculty and clinical facilities. Those owned by universities and state authorities are seeking increased autonomy for their clinical enterprises so they can respond more effectively to market forces. Some AHCs have concluded that they should not be in the business of managing clinical enterprises at all, and sold all or part of their affiliated clinical facilities. Many AHCs are trying to increase the role of clinicians in governing their clinical enterprises and to increase their ability to govern faculty by increasing faculty accountability, sometimes reducing the role of tenure in the process.

Most AHCs are also trying to improve the performance of their clinical enterprise. Their two major approaches are to increase market share and reduce costs. To increase market share, they are developing primary care networks through a variety of strategies: adding to internal primary care faculty, buying primary care practices, or affiliating with outside groups. They are developing strategies for improving specialty care market share, in some cases undertaking large and complex mergers with traditional rivals for this purpose. Several of these mergers already accomplished have failed. The fate of others remains to be determined.

Another tactic to enhance market share is the creation of IDSs. Like mergers, academically based IDSs have a mixed track record, though their conceptual appeal remains. To reduce costs and improve efficiency, AHCs have undertaken dramatic downsizing and invested in clinical process redesign using techniques imported from industry. Mergers and IDSs are also undertaken in part for their potential to reduce costs, though these complex strategies have probably proved less successful than old-fashioned approaches, such as reducing full-time employees and closing beds.

A number of AHCs have also endeavored to improve the performance of mission related activities, as exemplified by reforms in their management of research. Institutions have sought to increase research revenues through cultivating industrial relationships and commercializing their own research. AHCs have also attempted to improve efficiency of research through strategic planning, creation of interdisciplinary research centers and core facilities, and trying to institute peer review mechanisms for allocation of discretionary research resources.

Despite all these efforts, AHCs have missed some important opportunities. Their efforts to develop internal leadership are primitive by the standards of other industries.

Their information systems are similarly underdeveloped, complicating the management of both clinical and mission activities.

It is also far from clear that these diverse and extensive reform initiatives will prove sufficient to prepare AHCs for continuing tumult in the health care system. Ultimately, these institutions, though university-based, are intimately connected to that health care system. As its costs increase, so do AHCs'. As society seeks to redirect and reform the health care system, it will inevitably demand comparable changes from AHCs. Perhaps the most important capability for the future success of AHCs and their mission-related activities is the development of the capacity for innovation: skilled, creative leadership; adaptive and flexible governance; improved information systems to support decision-making; and an appropriate balance of centralization and decentralization within the unique structure of the university-affiliated clinical enterprise. Developing this capacity for adaptation will require that AHCs become much more self-critical and open than they have been in the past. As long as society continues to entrust AHCs with essential social functions, their ability to become truly modern institutions will remain of vital interest to the public and its representatives.

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#312 *From Bench To Bedside: Preserving the Research Mission of Academic Health Centers* (April 1999). This policy report of The Commonwealth Fund Task Force on Academic Health Centers is intended to provide a resource for future policy development and management related to the research mission of academic health centers. It also examines how recent changes in the health care market and public policies may hamper the ability of academic health centers to conduct research as effectively as they have in the past.

#330 *New Approaches to Academic Health Center Affiliations: Public Hospitals and the Department of Veterans Affairs* (April 1999). Jo Ivey Boufford, Larry Gage, Kenneth W. Kizer, Luis R. Marcos, John H. Short, and Katherine E. Garrett. This issue brief summarizes a panel discussion regarding new approaches to academic health center affiliations that took place at New York University's Robert F. Wagner Graduate School of Public Service.

#307 *Patterns of Specialty Care: Academic Health Centers and the Patient Care Mission* (January 1999). James A. Reuter, Georgetown University. The author defines the specialty care mission, presents an initial qualitative evaluation of patterns of this care in academic health centers, major teaching hospitals, and non-teaching hospitals, and attempts to identify measures for tracking future changes in the provision of specialty care.

#265 *Key Issues in Community Hospital and Academic Medical Center Consolidations* (April 1998). David Altman, The Lewin Group. In an effort to inform community hospital leaders of the issues involved in hospital acquisitions and mergers, the author developed this primer to explain the motivations and principles involved in consolidations, to assess consolidation options and the critical points that must be addressed, and to provide lessons derived from institutions that have recently consolidated.

#381 *Trends in Specialized Surgical Procedures at Teaching and Nonteaching Hospitals* (January/February 2000). Rebecca Levin, Ernest Moy, and Paul F. Griner. *Health Affairs*, vol. 19, no. 1. This article examines how the risks and high costs associated with the large number of complex surgical procedures performed by major teaching hospitals have serious implications for the perceived efficiency of these institutions.

Academic Health Centers on the Front Lines: Survival Strategies in Highly Competitive Markets (September 1999). David Blumenthal, Joel S. Weissman, and Paul F. Griner. *Academic Medicine*, vol. 74, no. 9. In this article, the authors describe approaches that five academic health centers have taken to reduce costs, enhance quality, or improve their market positions since the onset of

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price competition and managed care. Copies are available from David Blumenthal, M.D., Institute for Health Policy, Massachusetts General Hospital, 50 Staniford Street, Boston, MA 02114.

#337 *Market Forces and Unsponsored Research in Academic Health Centers* (March 24/31, 1999). Joel S. Weissman, Demet Saglam, Eric G. Campbell, Nancyanne Causino, and David Blumenthal. *The Journal of the American Medical Association*, vol. 281, no. 12. This article looks at how increased competitive pressures on academic health centers may result in reduced discretionary funds from patient care revenues to support unsponsored research, including institutionally funded and faculty-supported activities.

#291 *New Bottles for Vintage Wines: The Changing Management of Medical School Faculty* and *Reforming the Structure and Management of Academic Medical Centers: Case Studies of Ten Institutions* (June and July 1998). Paul F. Griner and David Blumenthal. *Academic Medicine*, vol. 73, nos. 6 and 7. In the first article, the authors offer a comprehensive review of innovative practices to reform faculty responsibilities. Among the changes they describe are appointment letters that detail explicitly the roles and responsibilities of faculty members, annual performance reviews, promotions tied to performance, and enhanced communication with administrators. In the second article, the authors explore changes instituted by medical schools to improve their efficiency. Reforms highlighted include designing strategic plans for individual departments, streamlining and consolidating departments, improving teaching programs, and exploring new sources of revenue.

#339 *Relationship Between Market Competition and the Activities and Attitudes of Medical School Faculty* (July 1997). Eric G. Campbell, Joel S. Weissman, and David Blumenthal. *Journal of the American Medical Association*, vol. 278, no. 3. The authors argue that increased competitiveness of health care markets may hinder the capacity of academic health centers to conduct clinical research and foster the careers of young clinical faculty.

#338 *Relationship Between National Institutes of Health Research Awards to U.S. Medical Schools and Managed Care Market Penetration* (July 1997). Ernest Moy, Anthony J. Mazzaschi, Rebecca J. Levin, David A. Blake, and Paul F. Griner. *Journal of the American Medical Association*, vol. 278, no. 3. The authors provide evidence of an inverse relationship between growth in NIH awards during the past decade and managed care penetration among U.S. medical schools.

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